

The obstetrical hysterectomy: epidemiology, associated factors, perinatal outcomes and maternal complications

Keywords: Obstetric hysterectomy; Obstetric emergency; Placental accretism

Introduction

Obstetrical hysterectomy is, perhaps, one of the most challenging surgical interventions because of its implications for maternal and infant health. It is associated with severe complications in the mother and in the newborn, directly related with the conditions that generate it and with high maternal morbidity and mortality, secondary to the underlying condition and to the procedure per se. As other authors reported,¹⁻⁶ we have also seen an increasing frequency of obstetric hysterectomy (OH). Furthermore, placental accretism is the most frequent indication. Thus, a highly risky picture is generated, threatening obstetric and neonatal outcomes. Several authorities have observed this phenomenon of placental accretism, and all of them agree in reporting an increase of OH incidences and its causes.¹⁻⁶ Apparently, the high frequency of abdominal cesarean section, and especially, its reiteration in the same patient, could cause changes in the myometrium and decidua which generate anomalies in placental insertion, and finally, an abnormal spread of the trophoblast within the uterine wall. Placental accretism not only have been observed during the third trimester of gestation, but in the Buenos Aires Hospital Alemán, three patients were admitted with an incoercible hemorrhage during the first trimester that finally ended with an unavoidable OH. Pathological examinations confirmed the diagnosis of placental accretism.⁷ These data seem to suggest that we are facing important changes in incidence and indications for OH. Surgical technique of hysterectomy performed for placental accretism is more complex and causes a more severe anatomical distortion than when the procedure is performed for uterine atony or rupture. Therefore, maternal complications and even mortality rates are higher.

Objective

To assess epidemiological findings, frequency and diseases associated with obstetrical hysterectomy, Perinatal outcomes and maternal complications in a series of 55patients.

Materials and methods

Data obtained from a group of patients that underwent OH between January, 2005 and January 2015 were reviewed. Nearly all the women were assisted in Hospital Materno infantil "Ramón Sardá", and the remaining ones, at Hospital Alemán; all of them located in Buenos Aires. Inclusion criterion was the need to perform a hysterectomy in an obstetric patient. In this way, the hysterectomy group (HG) was made up with 55patients. The study protocol included epidemiological data, pregnancy outcome, Perinatal results and maternal complications. The indication for hysterectomy was obtained from surgical forms in all the cases, and pathological examinations confirmed the diagnosis of placental accretism. General population (GP) assisted at Sardá Hospital during the same period was used as the comparison

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group, as the larger number of patients was assisted at that center. Maternal age was related in general and according to the indication for hysterectomy. Amongst conditioning factors, the number of prenatal controls; general associated diseases and related with the indication for hysterectomy; mode of ending of gestation; indication for cesarean section; anesthetic procedure used during cesarean sections and hysterectomies; indications for hysterectomy and type of hysterectomy were analyzed. Perinatal results were assessed considering gestational age at birth, incidence of neonatal low birth weight, Apgar's scores at one and five minutes, and incidence of late fetal mortality. Finally, maternal post-surgical complications and late maternal outcomes were analyzed.

Results

A comparison of maternal age in the HG and in the GP is presented in Table 1. The proportion of patients aged 30years or more in the HG women is higher than in the GP (Chi square, $P<0.000001$) (OR 18.8, 95% CI 8.18-45.5). In Table 2, maternal age in patients from the HG whose hysterectomies were performed because of placental accretism (PA) is analyzed. The proportion of patients aged 30years or more was also significantly higher than in the GP (Chi square, $P<0.000001$) (OR 23.8, 95% CI 6.88-98.6). In Table 3, maternal ages in patients who underwent hysterectomies because of uterine atony (UA) are analyzed. Again, the proportion of patients aged 30 or more was higher in the HG (Fisher's test, $P<0.000003$) (OR 12.8, 95% CI 3.46-46.56). The frequency of prenatal visits is presented in Table 4. No differences were observed in the percentages of patients with prenatal visits or without them between both groups (Chi square, $P=0.894$), with an average of 4.63 ± 2.57 prenatal visits in HG patients. In Table 5, the incidence of maternal gestational diseases is presented. Some differences in the numbers of each group are observed because some patients suffered more than one disease associated with the current pregnancy, so the denominators are different. The incidence of placenta praevia in the HG was 35.08%, and in the GP, 0.8% (Chi square $P<0.001$) (OR 20.1, 95%CI 11.2-35.9). In the patients with

placenta praevia (PP), 28.07% were completely occlusive and 7.01% were marginal. No differences were observed between the incidence of any other maternal gestational disease. In Table 6, the distribution of diseases associated with current pregnancy in patients in whom a hysterectomy was performed because of PA is presented. No other diseases were observed in 34.5% of patients in the HG and in 67.8% of patients in the GP (P<0.002). The incidence of PP in the HG was of 44.82%, versus 0.8% in the GP (P<0.001). In turn, 41.37% of cases with PP were completely occlusive and 3.44% were marginal. No significant differences were observed for any other maternal disease. In Table 6, the association between PP and placental accretism is analyzed. In patients with hysterectomy because of PA, a significant association with PP was observed (Chi square P<0.000001) (OR 95.6, 95%CI 43.2-210.7). The Table 7 shows the mode of ending of pregnancy. The expected results for each mode of delivery for the HG are presented in brackets. The number of cesarean sections was clearly higher than expected (Chi square P<0.0000001). In Table 8, the indications for cesarean section are listed. The most common was for repeated cesarean section (46.51%), followed by occlusive PP (13.95%). In patients that underwent hysterectomy because of PA (Table 8), the most common indication for cesarean section was a repeated intervention (65.4%), followed by occlusive PP (15.4%). In the subgroup of patients that underwent a hysterectomy because of uterine atony (Table 2), the most common indications were lack of progression and descent of presentation (25%) and occlusive PP (25%). As to the anesthetic procedure, Table 9 shows that, for cesarean section, peridural anesthesia was applied in 72.09% of cases, general anesthesia in 25.58%, and spinal anesthesia in 2.32% of women. Instead, for hysterectomy, general anesthesia was applied in 59.25%, peridural anesthesia in 38.88% and spinal anesthesia in 1.85% of patients. The indications for hysterectomy (Table 10) were: PA in 52.70%, UA in 30.90%, uterine rupture in 11%, hypovolemic shock in 3.6% and uterine myomatosis in 1.8% of patients (Table 11).

Table 1 Maternal age

Age	HG*	GP
>= 30	48	1873
<30	7	5141
All	55	7014

Chi square P<0.000001, OR= 18.8 (CI 8.18-45.5), *Hysterectomy group, **General population Hospital Materno Infantil Ramón Sardá

Table 2 Maternal age in patients underwent to hysterectomy by placental accretism

Age (years)	HG	GP
>= 30	26	1873
< 30	3	5141
All	29	7014

Chi square P<0.000001, OR=23.8(CI 6.88-98.6).

Table 3 Maternal age in patients underwent to hysterectomy by uterine atony

Age (years)	HG	GP
>=30	14	1873
<30	3	5141
All	17	7014

Fisher test P<0.000003, OR=12.8(CI 3.46-56).

Table 4 Prenatal controls

Prenatal control	HG		GP	
	N	%	N	%
Yes	33	76.74	45924	74.7
No	10	23.25	15555	25.3
	n: 43		n: 61479	

Chi square P=0.894, Average: 4.63+-2.57 controls (rango 01-09).

Table 5 Maternal pathologies during the present pregnancy

Pathology	HG		GP		P
	N	%	N	%	
Placenta previa	20	35.08	518	0.8	<0.001*
PP Occlusive	16	28.07			
PP Marginal	4	7.01			
	n: 57 pathologies		n: 19778 path.		

There were no significant differences among another pathologies,*Chi square P<0.000001, OR=20.1(CI 11.2-35.9)

Table 6 Maternal pathologies during the present pregnancy in patients who underwent to hysterectomy by placental accretism

Pathology	HG		GP		P
	N	%	N	%	
None	10	34.50	41701	67.8	<0.002
Some	19	65.60	19778	32.2	<0.004
Placenta previa	13	44.82			
PP Occlusive	12	41.37	518	0.8	<0.001
PP Marginal	1	3.44			
	n: 29 pathologies		n: 61479 path.		

There were no significant differences among another pathologies.

Table 6A Association between presence of placenta previa and hysterectomy by placental accretism

Placenta previa	HG	GP
Yes	13	518
No	16	60961
All	29	61479

Chi square P<0.000001, OR=95.6(CI 43.2-210.7).

Table 7 Mode of ending the pregnancy

Delivery	HG	GP
Spontaneous	8(42)	51176
Forceps	3(3)	3581
C. Section	44(10)	11775
All	55(55)	66532

Chi square P<0.0000001, In brackets the expected mode of delivery.

Table 8 Indications of cesarean sections n: 43

Indication	N	%
Previous Opitz	1	2.32
Placental accretism	1	2.32
Labor arrest	2	4.65
Previous two or more C. Sections	20	46.51
Preeclampsia	1	2.32
Uterine rupture	2	4.65
Iterative C. Section-Uterine bleeding	2	4.65
Distocia	1	2.32
Occlusive placenta previa	6	13.95
Uterine myoma	2	4.65
Cephalopelvic disproportion	3	6.97
Abruptio placentae	2	4.65

Table 9 Anesthetic procedure for C Sections and hysterectomies

Anaesthesia	C. Section		Hysterectomy	
	N	%	N	%
Epidural	31	72.09	21	38.88
General	11	25.58	32	59.25
Raquid	1	2.32	1	1.85
	n: 43		n: 54	

Table 10 Hysterectomy indications

Indication	N	%
Placental accretism	29	52.70
Uterine atony	17	30.90
Uterine rupture	3	5.50
Hypovolemic shock	2	3.60
Uterine rupture and atony	3	5.50
Uterine myoma	1	1.80

Table 11 Type of hysterectomy n: 55

Surgery	N	%
Total hysterectomy	35	63.60
Total adnexal hysterectomy	4	7.30
Subtotal hysterectomy	15	27.30
Subtotal adnexal hysterectomy	1	1.80

The following information was obtained through the analysis of perinatal results:

The incidence of preterm births with less than 34 weeks of gestational age (Table 12) was significantly higher in the HG (Fisher's test, P<0.00072) (OR 6.28, 95% CI 2.38-15.6), as well

as the incidence of low birth-weight neonates (Table 13) (Fisher's test, P<0.0061) (OR 2.71, 95% CI 1.31-5.48). Moderate and severe depression at the first minute of life was significantly higher in the HG (Table 14) (Chi square P<0.0000001), as it was during the fifth minute (Table 15) (Fisher's test, P<0.000001) (OR 33.4, 95% CI 14.8-73.9)-Late fetal mortality was clearly higher in the HG (Table 16) (145.54 per 1,000 vs. 5.7 per 1,000, difference between proportions, P<0.001). Amongst maternal post-surgical complications (Table 17), the most common was intraperitoneal hematoma (36.84%), followed by abdominal wall infections (15.78%), urological injuries (10.52%) and with the same incidence each, maternal death because of amniotic fluid embolization, disseminated intravascular coagulation and wall hematoma (5.62%). Four patients were referred to another center because they needed high complexity intensive care (21.05%). Post-surgical maternal outcomes (Table 18) included one death (1.80%), uncomplicated outcomes in 61.8% and complicated outcomes in 36.40% of cases.

Table 12 Gestational age of newborns (week's)

Gestational age	HG	GP
<34	6	138
>=34	48	6928
All	54	7066

Table 13 Newborn's weighth (grames)

Weighth	HG	GP
<=2500	11	600
>2500	42	6209
All	53	6809

Table 14 Apgar score at the first minute

Apgar	HG	GP
*<=3	6(1)	78
*4-6	9(2)	255
>=7	39(51)	6476
All	54(54)	6809

Chi square P<0.0000001,*significant values, The Apgar expected between brackets.

Table 15 Apgar score at the fifth minute

Apgar	HG	GP
<7	10	45
>=7	45	6764
All	55	6809

Fisher test P<0.000001, OR=33.4(CI 14.8-73.9).

Table 16 Late fetal mortality

HG	GP
Aug-55	39/6809
145.54/thousand	5.7/thousand

Proportion differences $P < 0.001$.

Table 17 Maternal complications n: 19

Complication	N	%
Wound infection	3	15.78
Intraperitoneal hematoma	7	36.84
Abdominal wall hematoma	1	5.26
Urologic injuries	2	10.52
Intravascular disseminated coag.	1	5.26
Death by amniotic embolism	1	5.26
Referred	4	21.05

Table 18 Postsurgical maternal evolution

Evolution	N	%
Death	1	1.80
Uncomplicated	34	61.80
Complicated	20	36.40

Discussion

Several authors had demonstrated an association between advanced maternal age and a higher index of maternal complications during pregnancy.⁸⁻¹² The endocrine and hemodynamic overload characteristic of pregnancy may induce a lack of equilibrium that could predispose to clinical expression of subclinical maternal diseases during pregnancy or to an earlier manifestation of conditions that a woman could develop in the future.¹³ But, specifically it has been stated that advanced maternal age and multiparity are associated with a higher risk of PP,¹¹ and that maternal risk of death for hemorrhage is associated with advanced age.¹² In this study, a strong association between maternal age higher than 30 years and the risk of hysterectomy was found; therefore, the estimates of maternal morbidity and mortality in this series must be interpreted with caution.¹⁴⁻¹⁸ as the incidence of complications may probably be higher than the one reported here. In summary, the association between advanced maternal age, previous cesarean sections and placenta praevia, increases the risk of placental accretism. This condition forces to perform a more risky hysterectomy than the obstetric intervention for other indications, because anatomical and vascular distortion caused by myometrial invasion by the trophoblast is greater.¹⁹⁻²⁵ Furthermore, whatever the surgical indication be, the need to perform an obstetric hysterectomy or the underlying disease that conditions its indication are associated with a higher incidence of neonatal and maternal complications, including death.²⁶⁻²⁹

Conclusion

- i. Patients aged 30years or more have a higher risk of complications that need and obstetric hysterectomy.
- ii. The greater the number of previous cesarean sections, the greater the risk of obstetric hysterectomy because of placental accretism and uterine rupture.
- iii. The association between maternal age higher than 30years, previous cesarean sections and placenta praevia increased 95-fold the risk of obstetric hysterectomy.
- iv. If a hysterectomy must be performed, it's wise to convert an epidural anesthesia to general anesthesia.
- v. Preterm birth, low birth-weight newborns and late fetal mortality were higher, being the last one 35-fold greater than in the GP.
- vi. Maternal complications during the Intraoperative and postoperative periods were severe, including death.
- vii. At present, the only option to control this problem is a wise use of abdominal cesarean section, since its unjustified reiteration sets the epidemiological and pathophysiologic basis for the complications reported in this study.

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Conflict of interest

The author declares no conflict of interest.

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